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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,577	08/26/2003	Douglas A. Hawks	050324-1161	5977

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EXAMINER

TRINH, MICHAEL MANH

ART UNIT	PAPER NUMBER
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2822

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/649,577

Applicant(s)

HAWKS ET AL.

Examiner

Michael Trinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

*** This office action is in response to Applicant's amendment filed on October 15, 2004.

Claims 9-15 were canceled. Claims 1-8,16 are currently pending.

*** The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC §

1. Claim 4 is objected as "said die attach pad" lacks antecedent basis. Apparently, in claim 4, line 1, the phrase "of claim 1" should be --of claim 3--.

Claim Rejections - 35 USC § 112

2. Claims 1-8,16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re base claim 1, meaning and scope of "forming isolated conductive features" together with "attaching a removable material...after said isolated conductive features have been formed..." are unclear and indefinite. Since the removable material is attached after the isolated conductive features have been formed, and since by isolated, the isolated conductive features are apparently drop down and falling out as there is nothing to hold them.

(Dependent claims are rejected as depending on rejected base claim)

Insofar as understood, the claims are rejected as below

Claim Rejections - 35 USC § 102

3. Claims 1-6,16 are rejected under 35 U.S.C. 102(e) as being anticipated by Yamaguchi (6,166,430).

Yamaguchi teaches (at Figs 1-6, 7a to 9f; col 6, line 40 through col 16) a method for forming a package for an electrical device, the method comprising the steps of forming isolated conductive features 9,14 within a conductive material 11,15 (Figs 1-2; col 8, line 18-67; col 6, line 40 through col 7); attaching a removable material 12 to a surface of the conductive material after forming the isolated conductive features 9 (Fig 4, lines 45-54); attaching encapsulant 19 to said isolated conductive features 9,14 and said removable material 12 (Figs 5c,7d,9d; col 9, lines 32-67; col 11, lines 1-40); and removing said removable material 12 from said conductive

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features and said encapsulant 19 (Figs 7d-7e, 9d-9e; col 11, lines 41-52). Re claim 3, wherein a die attach pad 14 is formed within said conductive material 11, 15 (Figs 1, 4; col 6, lines 40 through col 7; col 8, lines 45-67). Re claim 4, wherein the device 17 is coupled to said die attach pad 14 (Figs 5a-5b; 7b-7f; col 9, lines 32-53; col 10, lines 59-67). Re claim 5, wherein an input/output portion of the device 17 is electrically coupled to said isolated conductive feature 9 (Figs 7c-7f, 6; col 10, lines 20-34; col 10, line 63 through col 11). Re claim 6, wherein the method further comprises the step of singulating individual packaged devices (Figs 7e-7f; col 11, lines 53-67; col 7, lines 17-22). Re claim 16, wherein the removable material of plastic film 12 of polyimide is used and acted as a molding stencil during molding of encapsulant 19 (Figs 7d, col 11, line 1 through col 12).

4. Claims 1, 5, 7, 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Fjelstad (6,266,872).

Fjelstad teaches (at Figs 2, 1A-1F) a method for forming a package for an electrical device, the method comprising the steps of forming isolated conductive features 24 within a conductive material (col 7, line 45 through col 8, Fig 1B); attaching a removable material 10/18 to a surface of the conductive material 24 after forming the isolated conductive features 24 (Fig 1F, col 8, lines 55-65; col 7, line 67 through col 8); attaching encapsulant 32 to said isolated conductive features 24 and said removable material 10/18 (Fig 1F; col 8, lines 1-65); and removing said removable material 10 from said conductive features 24 and said encapsulant 32 (Fig 1G; col 9, lines 1-19). Re claim 5, wherein an input/output portion of the device 40 is electrically coupled to said isolated conductive feature 24 (Fig 2; col 9, lines 1-67). Re claim 7, wherein the removable material 18 is a water soluble material (col 8, lines 1-29; col 9, lines 10). Re claim 16, wherein the removable material 10 used during molding of encapsulant 32 to the conductive features 24 is a molding stencil 10 (Fig 1F; col 7, line 67 through col 8).

Claim Rejections - 35 USC § 103

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi (6,166,430) taken with Glenn (6,247,229).

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Yamaguchi teaches (at Figs 1-6, 7a to 9f; col 6, line 40 through col 16) a method for forming a package for an electrical device as applied to claims 1,3-6,16 above.

Re claim 2, Yamaguchi already teaches (at col 8, lines 22-45) etching the conductive material to form the isolated conductive features 9,14, but lacks mentioning pattern the surface with a material resistant to an etchant.

Glenn teaches (at col 3, lines 54-67; Figs 2-4) forming isolated conductive features within a conductive material by patterning a surface of the conductive material 13 with a material resistant of photoresist to an etchant and etching said conductive material 13 with said etchant (col 3, lines 54-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the conductive features of Yamaguchi by patterning a surface of the conductive material with a material resistant to an etchant and etching said conductive material with the etchant, as taught by Glenn. This is because of the desirability to protect the conductive material from being etched at other portions and to form the conductive features at selected portions within the conductive material.

6. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi (6,166,430), taken with Wyland (6,111,199) and Weng et al (5,972,234).

Yamaguchi teaches (at Figs 1-6, 7a to 9f; col 6, line 40 through col 16) a method for forming a package for an electrical device as applied to claims 1,3-6,16 above.

Re claims 7-8, Yamaguchi already teaches (at col 7, lines 28-34) the removable material of plastic comprising any resin-based film such as polyimide. Claim 7 recites the removable material comprising a water soluble adhesive. Claim 8 recites removing the removable material with deionized water.

However, *Wyland et al* teach (at col 8, lines 1-10; col 7, lines 54-67) forming an adhesive resin film on a substrate, wherein polyimide, alkali-soluble resin, or water-soluble resin are alternatively used for forming the adhesive resin film. Weng teaches (at col 5, lines 34-37, 27-51) removing the removable adhesive material with deionized water (as a pure water).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the removable material of Yamaguchi by alternatively using the

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water-soluble resin (a water soluble adhesive), as taught by Wyland. This is because the substitute art recognized equivalent removable materials, as alternative materials, is within the level of one of ordinary skill in the art, wherein removable material of water-soluble resin, plastic, or polyimide are highly adhesive to the terminals of the lead frames. By using water soluble resin/adhesive, removing the removable materials can be easily performed with water, that is less expensive, and wherein by using deionized water, as a high purity water, ion contamination of the device is prevented and thereby improving reliability and quality.

Response to Arguments

7. Applicant's amendment and remarks filed October 15, 2004 have been fully considered but they are moot in view of the new ground(s) of rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael M. Trinh whose telephone number is (571) 272-1847. The examiner can normally be reached on M-F from 8:30 Am to 4:30 Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Oacs-15



Michael Trinh
Primary Examiner